CS4203 INTERACTIVE COMPUTATION SYSTEMS (3-2)

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COURSE OBJECTIVES:

- · Recognize and describe human factors issues relevant to designing human-computer interfaces
- Understand the relationship between human error and poor design and how to circumvent both
- Understand the trade-offs of training costs versus usability engineering costs
- Design a human-computer interface with an iterative, design/prototype/evaluate development process and apply specific design guidelines as part of this process
- Select appropriate interaction devices and techniques from among alternatives
- Select appropriate dialogue style from among alternatives
- Critique existing or proposed human-computer interfaces using concepts taught in the course

REQUIRED TEXT:

Preece, J. et al. (1994). Human-Computer Interaction. Reading, MA: Addison Wesley.

SUPPLEMENTARY TEXTS:

Neilsen, J. (1993). Usability Engineering. Boston: AP Professional.

Hix, D. & Hartson, H.R. (1993). Developing User Interfaces: Ensuring Usability Through Product and Process. New York: John Wiley & Sons.

PREREQUISITES

CS3300 or consent of instructor.

COURSE CONTENT

Human-Computer Interaction [Preece1-2; Hix1; Nielsen2]

Why is usability important?

What is usability?

What is the value of usability engineering?

Iterative Evaluation-Design Development [Preece19-22; Hix4-5; Nielsen4]

Requirements gathering

Task analysis

Conceptual design

Physical design

Design Support and Prototyping [Preece23-28; Hix2,9,11; Neilsen8-9]

Design Heuristics [Neilsen5]

Guidelines and Standards

Low-fidelity prototyping

Rapid Prototyping

User Interface Management Systems

GUI Toolkits/Frameworks

Interaction Styles [Preece13-16; Hix3; Nielsen3]

Windows, Icons, Mice, Pointing (WIMP)

Menus, Forms, Boxes

Command languages

Natural language

Graphical interfaces (Direct manipulation)

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Others (Virtual Environments, Personal Data Assistants, Multimedia)

Design Methodologies [Preece17-18]

User-Centered Design

Evaluation-Centered Design

Work (Task)-Centered Design

Participatory Design

Design Evaluation [Preece29-34; Hix10; Neilsen6-7]

Observation

Formative versus Summative Analysis

Verbal Protocol

Subjective Measures

The Human in Man-Machine Systems [Preece3-10]

Perception

Attention and Memory

Knowledge and Mental Models

Metaphors

Learning

Input/Output Technology [Preece11-12; Hix3]

Input devices

Output devices

Matching devices to tasks

LABORATORY AND COURSE ORGANIZATION

This course is largely project-oriented. Grades will be determined based entirely on projects and class participation. Our objective is to complete one full iteration of the design-prototype-analyze development cycle during the duration of this course. Projects 1 and 2 are to be done individually. For all other projects, students will work in groups and will submit a single report. For the rapid prototyping phase, students may use any language in any environment they wish but their prototype should be demonstrable to the class in Spanagel Hall. Development tools and methods may be dependent on the results of our in-class project to define the requirements of our application (3A). Students must demonstrate an understanding of usability engineering, evaluation and design methods, and general knowledge of human-computer interaction over the duration of this course and project series.

PROJECT 1: Critique an existing application.

PROJECT 2: Analyze an existing application.

PROJECT 3A (in-class): Requirements gathering

PROJECT 3: Application design

PROJECT 4: Low-fidelity prototype

PROJECT 5A (in-class): Task analysis selection

PROJECT 5: Preliminary usability analysis — Redesign

PROJECT 6A (in-class): Constrain application for prototype phase

PROJECT 6: Rapid prototype

PROJECT 7: Usability study

PROJECT 8: Redesign application

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